

LASER DISCHARGE CHAMBER PASSIVATION BY PLASMA

Tom A. Watson
Richard L. Sandstrom
Richard G. Morton
Robert E. Weeks
John P. Quitter
Mark R. Lewis

5

ABSTRACT OF THE DISCLOSURE

10 Methods and apparatus are provided for cleaning and passivating laser
discharge chambers with plasmas. In one embodiment, an oxygen based plasma is
formed in a plasma source external to the laser discharge chamber by applying a
radiofrequency signal to oxygen containing gases. The oxygen based plasma is
drawn into the laser discharge chamber, where it reacts with contaminants and
cleans internal surfaces. After cleaning, a fluorine based plasma is formed in the
15 plasma source and drawn into the laser discharge chamber to passivate internal
surfaces. In another embodiment, cleaning with the oxygen based plasma is not
used since some level of cleaning is accomplished with the fluorine based plasma.
In another embodiment, oxygen based plasmas and fluorine based plasmas are
formed in the laser discharge chamber by applying a radiofrequency signal to a
20 laser discharge chamber electrode. Plasma cleaning and passivation of laser
discharge chambers is safer, more efficient, and more effective than conventional
thermal cleaning and passivation processes.